2007 UTHF: Trends of the Wireless World

Alan J Weissberger (volunteer)

aweissberger@sbcglobal.net

I.   Executive Summary

With so much of the telecom spending and growth shifting from wire-line to wireless networks, the theme of this year's annual conference was quite appropriate: the current status and future directions of the Wireless World. The focus was on the macro view, zoom-out picture of wireless applications, business models, markets and partnerships for successful integration of technologies.   Leading industry experts from Microsoft, Nokia, Google, NEC, and Sagacity Networks, as well as representatives from leading edge start-up companies (e.g. Digital Fountain) provided their perspective on the wireless world. They spoke of the critical issues and important dynamics that are having a huge impact on company's business models, mobile office workers, and consumers.

The Conference agenda can be viewed at:

http://natea.org/sv/conferences/uthf/2007/agenda_abstract.php

What was apparent from all the keynote presentations, breakout sessions and panel discussions, was the huge shift underway from standalone applications accessed from fixed locations to full- scale mobility. That is, making all types of information (voice, video, Internet, games, GPS, etc) available to people on the move with mobile devices (either all- in- one/ multifunctional gadgets or special purpose devices). The telecom industry is particularly in a state of transition, as traditional telco's have to provide additional value now to prevent being reduced to commodity bandwidth providers. According to Microsoft, partnering with Web 2.0 software companies is needed to provide additional value. Telco's should also consider providing services for not only consumers, but also small and medium businesses (SMBs). Examples of such value added services include: hosted CRM, messaging and collaboration. More are listed in the Telco 2.0 keynote summarized below.

II.   Telco 2.0 in the Mobile Landscape, Sanjiv Parikh, Microsoft

Sanjiv heads up **Mobility** for Microsoft's **Emerging Business Team**, which drives Microsoft's interaction with VCs and start-up companies. Sanjiv stated that Microsoft "delivers integrated, adaptable, comprehensive solutions based on innovative software, that helps service providers (i.e. telcos) develop and deploy revenue generating services." Well, that is quite a mouthful, but there is actually a credible vision behind this objective- Telco 2.0.   According to Microsoft, "Telco 2.0 is defined as the convergence of a carrier's foundation/network services integrated with Web 2.0 type services by 3rd party services."

Simply put, Telco 2.0 is the marriage of the traditional telco backend/ OSS/BSS services (e.g. billing, customer care) and location based services, with innovative applications, which may include user- generated videos and other content.   Referred to by Sanjiv as "**managed network mash-ups**," Telco

2.0 applications/ services might include: mapping augmented with user generated content, merging of disparate data bases and making results available to mobile subscribers in a meaningful way (e.g. farmers in India checking current commodity price quotes on their mobile phones), advertising based video/ music/ audio content, local search – all delivered by and through the carrier's network.

Microsoft's market research states that there is a propensity for smaller companies (50 to100 employees) to outsource communications and IT services. As telcos are a trusted source, they are likely to be considered to provide hosted services like mobile VoIP combined with CRM, messaging, collaboration and other hosted network based applications, IT support, transaction based processing, mobile video broadcasting and others. Sanjiv stated that Microsoft expected the Telco 2.0 market opportunity to be huge, but did not state any time frames or metrics.

Sanjiv stated that disruptive wireless technologies and new, advertising based business models were transforming the telecom industry. "Service Providers must make the transition to Telco 2.0 to thrive," he said. *We detected more of a sense of urgency for telcos and would suggest that they need to move even more quickly to Telco 2.0 applications and services.* Partnerships between web and communications companies will be key to making Telco 2.0 a reality. To this end, Microsoft is creating a Service Delivery Platform to enable the Telco 2.0 model and for customers to take advantage of 3rd party provided services.

Sanjiv gave examples of several start-up companies (e.g. Mountain View based Jajah with which provides VoIP calling) that are working with Microsoft to help create the Telco 2.0 future. The challenge is for those start-up companies to partner with telcos to make the mash-up services available to users in a convenient manner. From our personal experience, this will be a very difficult undertaking, as traditional telcos are very resistant to disruption and change.

Sanjiv concluded by saying that, "Microsoft is totally committed to be a strategic partner for Service Provider customers in this new world- for delivery of traditional telecom services married with Web 2.0 services over telco networks." *Bravo!*

III. Mobile Web and Converged Devices, Arthur Lin, Nokia

Note: This author knows Arthur from the early 1990s when he worked at Pac Bell and Cisco, where he was a very knowledgeable and well respected expert on ATM technology. So we paid very careful attention to what he said about the wireless world!

Main themes:

Media (especially video and music) has gone to the Internet and will continue to be **accessed by mobile subscribers**, providing an "on-line life on the move."

Mobile devices are evolving over the next few years so that they will become "**Multimedia Computers**" and will be people's Internet devices of choice. Mobile devices will connect everyone to everything. They will enable people to take all their applications with them when they are on the

move. Worldwide, 4B out of 6B people will have mobile devices in 2010. Nokia is selling 1M new mobile devices each day.

The mobile device has become the **fourth screen** (movie, TV, PC and now the cell phone). People are using mobile devices for multiple experiences. A 2006 study of Nokia S60 device use found these % of people using the following features: Camera 76%, Music 64%, Games 54%, Browse Internet 48%, Search and Navigation 51%,   Want to use maps 31%, Search on mobile devices (many want to use this capability, which is not widely available).

Nokia uses the Safari for a **mobile Internet browser**. Last year they shipped over 20M, will ship over 100M next year, and by 2010 they predict there will be 200M Nokia browsers.

The mobile devices are providing **smart connectivity**, with eight radios now in many mobiles. This provides users with ability to connect to multiple wireless networks, e.g. GSM cellular, EDGE, HSPDA, WiFi, Bluetooth, FM radio, GPS, mobile WiMAX, DVB, WCDMA, etc.

Other key points:

- Openness is a critical requirement for convergence: it is what fuels innovation. Open innovation with business partners and communities is happening now.

- Internet is transforming mobility and vice-versa, e.g. community and social networking

- Both device convergence and Internet convergence are happening. For example, you can now download your content via Nokia Content Discoverer. With 8G bytes of internal storage there are mobile devices that can be web servers, using Apache open source code.

- Mobility will take the Internet to new places and create a personal Internet experience with Web 2.0 like content. Nokia recently bought Navteq- an Internet map company- for $8.1B. It will soon be able to provide **global search** and **local find** capability to mobile users. As a result, you will be able to discover your favorite podcast and be connected on the move to social networking sites like My Space, Flickr, VOX and You Tube.

- New application/service access/UI functionality. Nokia has launched an ad service for mobile users (www.adservice.nokia.com). This will transform the way business and consumers use the web.

- Companies will interact, collaborate and develop with their customers, partners and suppliers in completely new ways. For example, companies and consumers are now interacting on Second Life (virtual reality life on the web)

- Nokia will be providing Internet Services to customers under the OVI tagline (Finnish acronym meaning: Open door to the Internet). The Internet services Nokia will offer in selected markets will be found at www.ovi.com. These might include games, music, video clips and TV, contacts, maps, photos, etc. [The Oct 19th FT reported that Nokia was involved in discussions with telecom operators to become partners in its (multimedia) Internet platform].

- Smart technologies will adapt to the individual and his or her context.

- Converged devices provide wireless broadband access and become mainstream

- Universal open innovation proliferates

- Mobility transforms the Internet- broadband content goes Mobile via IP/Internet

- Content is King (long live the King!)

IV. **Wireless Health Care Market**, Sophia Liu, Sagacity Networks

Wireless communication has already been proven to increase work quality, efficiency, and cost-effectiveness. The system eliminates manual data input and saves valuable resources. Compatible with the mobile attributes of present day healthcare, wireless data networking is also seen as a decision-support system, not simply a collector of data. The power of portable information appliances and wireless infrastructure plays an important role in the health care industry. From computers to cell phones to pagers to PDAs and tablet PCs, these tools can help the health care providers to maximize performance and capabilities, and help reach critical business and patient-care goals.

Due to the needs of an increasingly aging population, the medical devices, products and technologies are converging to revolutionize home- and self-care health systems. This makes it possible for people to play a greater role in maintaining their own health. The in-home health care systems are geared toward a prevention-oriented, consumer-driven health care model that includes innovations such as "smart devices" that can "think" for themselves, customized wearable devices, electronic patient records, and wireless Internet-linked systems--all expected to deliver convenient, user-friendly, intelligent health care in the home.

Wireless health care technologies are being used for many applications, including: mobile and home care, access to electronic health records, infusion therapy, telemetry/ monitoring, RFID and real time location services (RTLS), work flow optimization, etc. The specific wireless technologies being used include: WiFi (most popular), VoIP/WiFi, BlueTooth, Zigbee, UWB, and Wireless Sensor networks (see comparison Table).

Real time location systems (RTLS) may be the fastest-growing RFID application most people have never heard of. The market for these systems, which use active RFID or WiFi-enabled tags to track the location of assets in real time, is expected to grow to $1.26 billion by 2011, according to Frost & Sullivan. Wireless technologies for RTLS technologies are often rated on criteria such as: Low Power, Range (coverage area), Price, Deployment Cost, Installed Base, Reliability/Redundancy, and Accuracy. WiFi enabled Tablet PCs are used to collect and transmit clinical data about patient health.

Sagacity Network's target applications - are RTLS and Asset Tracking. These are optimal for active RFID and have excellent growth prospects.

Reference Sites for further information:

http://sagacitynetworks.com/

http://www.continuaalliance.org

http://www.agingtech.org/index.aspx

http://tie.telemed.org/homehealth/

http://www.wirelesshealthcare.co.uk/

http://www.nhianet.org/infusion/

V. End-to-End IPTV in the Wireless World, Charlie Oppenheimer, CEO of Digital Fountain

Editors Note: This title was a misnomer, as the video FEC-like software technology described had nothing to do with IPTV and could be deployed on wire-line as well as wireless networks. He did provide a good overview of mobile video entertainment.

Abstract: Mobile multimedia is one of the important growth opportunities for wireless operators worldwide. Consumers expect entertainment content wherever they are. Mobile operators need to determine which technologies can best enable a high-quality experience despite highly variable reception conditions. And at the same time, infrastructure requirements must be considered so that costs do not get out of control. Oppenheimer will review some of the alternative service models, technology choices and strategic tradeoffs.

Presentation: Charlie covered usage models, operator delivery choices and technologies for **mobile video.** He also elaborated on Digital Fountain's software, which mitigates the effects of packet loss and thereby provides improved video quality.

Broadcast model: Due to much lower costs and bandwidth requirements, the success of mobile video services will be dependent on being able to broadcast them (rather than use 1-to-1 or unicast video). A video stream uses 10 to 40 times the bandwidth of a voice call. With broadcasting, the bandwidth is fixed instead of being dependent on the number of users as in unicast video.

It is imperative for the video service provider to push as much video as possible to broadcast streaming with an idle time driven usage model. "Clip-casting," refers to the broadcast of popular content as files, which are then received and stored on mobile devices for playback. Examples include: video highlight clips, songs, ads, etc. These are cached on user handsets, based on subscriptions. Clip-casting provides a broader service area coverage and better picture quality at a lower cost. KDD in Japan has deployed a combination of on-demand video streaming with broadcast video clips.

Usage Models: Mobile video is not like watching TV on a cell phone, according to Charlie. "That is a lousy business model, driven by technology, not usage." There are two mobile video usage models:

1. Event Driven- occasional, view as it happens, e.g. breaking news stories

2. Idle Time Driven- watch while waiting for appointments, a restaurant or take-out meal, on a bus or train. All kinds of content can be provided when you view videos at your convenience. Watch different content at different times.

Live TV is necessary, but is an insufficient usage model. VoD (characterized by unscheduled use, view when you want when you want it), must also be taken into consideration.

Technology: Digital Fountain is a software company that leverages the use of FEC to create a process for delivering directories and video files, such that packet loss is much less of a factor in video quality. The technology dramatically increases range of streaming – a factor of 2 to 6 more coverage area is offered by their **DF Raptor** product line. **Broadcast streaming is event driven.** Quality is needed, but is difficult to achieve. The mobile user population has widely varying reception conditions- depending on location from a cell tower. If quality improves, viewing times will likely double, meaning more revenue for the video service provider.

In particular, **DF Toughstream,** may be able to eliminate block errors, tearing, jumps, video and audio loss. The following advantages are realized with **DF Toughstream**:

- Reliable broadcast transmission to any number of devices

- Eliminates need to receive specific packets, only sufficient quantity

- Extends effective broadcast coverage area

- Minimizes required broadcast duration for any file

- Allows for more content to be delivered with same bandwidth

Postscript: Alleviating video frame freezes and video buffer depletion

When watching streaming Internet video, did you ever notice the picture freezing for a while? That is due to network congestion. The playback buffer empties and there is no more video to display, hence the picture on the screen remains.

In **Q1**, Digital Fountain will launch **DF Splash**, a new instant-on TV-quality content deliver network (CDN). This is an infrastructure service meaning that it will be available for use by any content provider so that they can deliver the kind of experience that consumers expect. The benefit is that the user will get protection both from aggregate packet loss and also from loss from congestion that will tend to impact one stream more than another at any point in time.

VI. **Trends in Mobile Advertising**, Dilip Venkatachari, Google

Note: Dilip is Director, Product for Mobile Ads for Google and has lots of experience in Internet based advertising.

- An open mobile network provides for a more connected lifestyle

- Social networking seems to be a natural fit with mobile communications

- Video ((broadcast and clips), radio, Internet, newspapers will all be offered to mobile subscribers. Rich content will be available everywhere!

- More and more web applications will be available on cell phones/PDAs

- Top US mobile search categories are: maps/direction, weather, local info, news, entertainment, sports scores, financial info

- Mobile can integrate on-line and off-line content

- Sending a text message on a mobile phone, while watching TV will be common

- Search ads are a natural monetization option for providing free information

- Relevance and metrics are most important parameters for web- based ads. Metrics provides the ability to measure how effective ads are.

- Mobile web-based ads will be an extension of traditional web based ads and may be predicated on user location

- Advertisements are 1-to-1 and not shared amongst users

- Inspiration may come from where we least expect it

Editors Note: There were two parallel sessions, which I could not attend or cover:

- Wireless USB Markets and Applications

http://natea.org/sv/conferences/uthf/2007/speakers_bio.php#Katsuhiko_Nakazawa_topic

- WiMAX -its Applications and Markets in Taiwan

http://natea.org/sv/conferences/uthf/2007/speakers_bio.php#Chunder_Wu_topic

VII. Panel Session

The conference concluded with a Panel Discussion amongst the following participants:

- Mr. Sanjiv Parikh, Director of Strategic and Emerging Business, Microsoft

- Mr. Ben Choi, Senior Associate and Kauffman Fellow, Storm Ventures

- Dr. Chunder Wu, Advisor, Institute for Information Industry (III), Taiwan

- Dr. Arthur Lin, VP & CTO, Enterprise Solutions, Nokia

The panelists were asked to consult their "personal crystal-balls" to predict the trends of the wireless world and identify the important technologies and issues which might impact the future. Here are their key points, shown in bullet format:

Sanjiv Parikh:

- Mobile browser technology (MSFT Internet Explorer Mobile competes with Symbian S60 as well as the Safari browser) will play a key role

- Open Source: cost is the issue to create good usability software; platform and technology are not the real factors

- Partnership of mobile ecosystems will be essential

- An important market is mobile advertisements

Ben Choi:

- Applications for robust mobile communications will be needed

- Data service market is picking up

- Educate the consumers to be used to the product is difficult

- Emphasis on the importance of mobile advertising market

Arthur Lin:

- The convergence of mobile devices (all services in one handset)

- Short development cycle in Internet environment enables service providers to try new concepts in the market

- Mobile infrastructure is built based on business case and so a sustainable business model is needed

- 3G (3.5G-to-3.75G) technology will be coming soon

Chun-Der Wu:

- Operations Administration and Maintenance (OAM) are needed for new mobile services

- IMS has enabled application development to be at a relatively high level

- Integrating products from different vendors is quite difficult

VIII. Wrap Up, Summary and Final Thoughts

The conference offered a very well balanced and comprehensive look at the evolving wireless world, with an emphasis on mobility, advertising based business models and a very revealing look at wireless health care applications.   Wireless video, broadcast to mobile users, may be a reality with new software for correcting video packets, as per Digital Fountain's presentation.

Final thoughts:

-Undoubtedly, the biggest opportunity for wireless is in the developing countries. The FT reports: "By 2010, it is predicted that emerging markets will account for more than 2/3rds of the world's telecom connections, and almost 90% of all growth in the world's mobile sector, with China and India leading the way."

Here is an example of the potential impact of wireless networks in the developing world:
At the November 8th SCU Technology Benefiting Humanity: **Taking Innovation to the Next Stage**, there was a presentation on an innovative mesh WiFi project in rural Vietnam. A summary of the presentation is available at:

http://www.wimax360.com/profiles/blog/show?id=610217%3ABlogPost%3A37195

-While wireless has already had a huge impact on the consumer and many "on the go" workers, it remains to be seen if enterprises will replace their Ethernets with various types of wireless networks (e.g. IEEE 802.11n). Security and privacy are issues we will need to be concerned with moving forward for wireless networks to continue their torrid growth trajectory.